FINAL
TECHNICAL SUMMARY REPORT

JUNE 1963

MAGNETIC TAPE STATION
FOR
PROTOTYPE SATURN
GROUND COMPUTER SYSTEM
NAS8-2636

PREPARED FOR

GEORGE C. MARSHALL SPACE FLIGHT CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
HUNTSVILLE, ALABAMA

DATA SYSTEMS DIVISION
RADIO CORPORATION OF AMERICA

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MAY 1962 THROUGH JUNE 1963

PROTOTYPE MAGNETIC TAPE STATION

(NASA CONTRACT NAS 8-2636)

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
HUNTSVILLE, ALABAMA

PREPARED BY

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CONTENTS

SECTION 1

INTRODUCTION

This is the final technical summary report on the development and production of a Prototype Magnetic Tape Station for the SATURN Ground Computer System. This report, submitted in accordance with the requirements of Article I B 3 of Contract NAS 8-2636, covers work conducted by RCA Data Systems Division from 7 May 1962 through 20 May 1963.

SECTION 2

SCOPE OF WORK

Contract NAS 8-2636 was awarded to the RCA Data Systems Division by NASA on 7 May 1962. Under the contract, RCA has furnished one Prototype Magnetic Tape Station for use with the RCA SATURN Ground Computer Systems at NASA installations.

The Prototype Magnetic Tape Station is identical to the three Magnetic Tape Stations furnished as part of Contract NAS 8-2603 and in point of time was the second of the total of four units delivered.

The Tape Station consists of an Ampex TM-4 Tape Transport, the Ampex DE-110 read-write electronics including power supplies and the RCA designed buffer logic. All of this equipment is assembled and packaged in an RCA 110 type cabinet. Figure 1 is a photograph of the tape station.

For the Prototype Magnetic Tape Station, the Ampex units were Government Furnished Equipment.

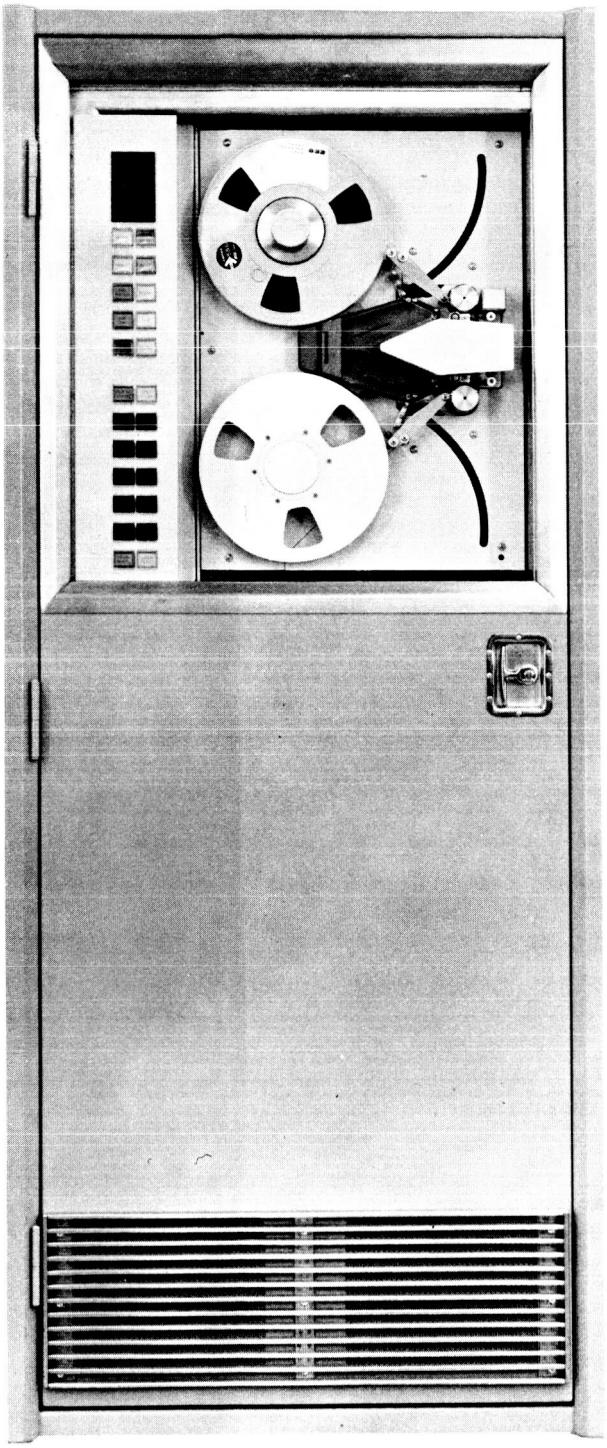

Figure 1

2.1 DESIGN EFFORT

Both electrical and mechanical design effort were required in the performance of this contract. The electrical effort consisted of designing the buffer logic and checking out the completed unit under computer control. The buffer logic made use of existing RCA 110 type module boards as used in the SATURN Ground Computer System with the exception of two new oscillator circuits which were designed and packaged on standard 110 module boards.

The mechanical design consisted of adapting the standard RCA 110 type cabinet to house the tape station. Particular attention was required in maintaining RFI integrity while still permitting access to the tape transport and controls.

Documentation including wire connection lists, copper path lists and instruction manuals with logic diagrams also were prepared and furnished under this contract.

SECTION 3

PROGRAM MILESTONES

Program milestones completed during the performance of this contract from May 1962 through June 1963 are outlined in the following paragraphs:

May and June 1962

Design started.

Signal interface defined between 110 computer, tape buffer and tape unit.

Released long lead items - cabinets, frames, module components.

July and August 1962

Design reviewes completed.

RFI suppresion required.

September 1962

Mechanical nest assembly complete.

Nest wiring started.

Module board assembly started.

October 1962 thru February 1963

Nest wiring suspended pending receipt of GFE tape unit.

March 1963

Buffer wiring completed and tested.

GFE Ampex tape unit received.

Tape Station assembly completed.

Checkout started.

April 1963

Magnetic Tape Station shipped, installed and checked-out.

Demonstration completed.

May 1963

Documentation requirements completed.

SECTION 4

PROBLEM AREAS AND RESOLUTIONS

The only problem area to occur during the contract was one of schedule slippage caused by the requirement that RFI suppression be included. This resulted in additional time being required by Ampex to rework the GFE Tape Unit to incorporate the modifications found to be necessary during tests of the tape units furnished under Contract NAS 8-2603.

While this caused shipment of the Prototype Magnetic Tape Station to be delayed until after the first unit furnished on Contract NAS 8-2603, it did result in all four tape stations being identical.

SECTION 5

INSTALLATION

Since the Magnetic Tape Station is contained in a single cabinet deriving all necessary power and signals by cables from the computer and not requiring mechanical connection to the computer, installation at the site is relatively simple and was performed as follows:

1. Equipment was unpacked and checked for shipping damage. Any minor damage was repaired.
2. Equipment was emplaced on the computer ground plane.
3. Cables were installed.
4. Unit was functionally checked-out from local control panel.
5. Unit was operationally checked-out under computer control.
6. Acceptance test was conducted using computer programs.